REMARKS

This Request for Reconsideration is submitted in reply to the final Office Action mailed November 24, 2006 ("the Action").

Claims 26-59 are pending in the application. Claims 29, 30, 34-40, 46-48, 50, 53, 58 and 59 are withdrawn from consideration by the Examiner as directed to non-elected inventions or species. Claims 26-28, 31-33, 41-45, 49, 51, 52 and 54-57 stand rejected.

Independent Claim 26, 41, 42 and 49 stands rejected under 35 U.S.C. Section 103(a) as being unpatentable over U.S. Patent No. 7,722,613 to Gelfand ("Gelfand") in view of Link, "Commotio cordis: Sudden death due to chest wall impact in sports" *Heart* 1999; **81**: 109-110 ("Link"). Applicants respectfully traverse the rejection under Section 103(a) for the following reasons.

Claim 26 recites method for performing chest compression during cardiopulmonary resuscitation (CPR), including:

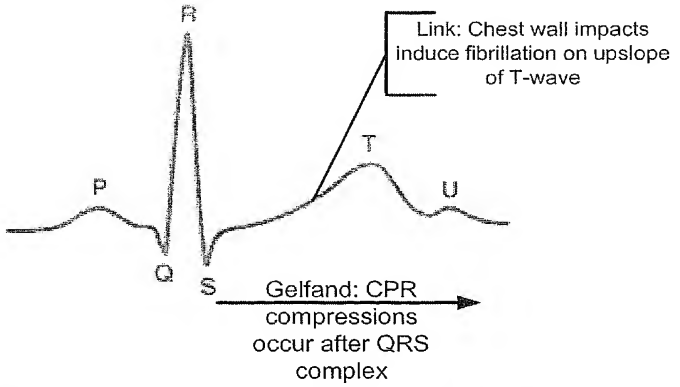
> sensing a parameter corresponding to a measure of intrinsic spontaneous cardiac activity of a heart in a subject undergoing CPR;
> identifying a vulnerable portion of an intrinsic spontaneous cardiac cycle of the subject based on the sensed parameter; and
> compressing the heart of the subject during a non-vulnerable portion of the intrinsic cardiac cycle based on the identifying step thereby inhibiting reinduction of fibrillation and/or improving cardiac function.

The Action concedes that Gelfand does not disclose identifying a vulnerable portion of an intrinsic spontaneous cardiac cycle of the subject and compressing the heart of the subject during a non-vulnerable portion based on the identifying step. However, the Action takes the position that compressions during CPR would inherently be considered low impact chest wall blows and that Link discloses that impacts on the upslope of the T wave results in ventricular fibrillation. The Action concludes that it would have been obvious to combine Gelfand with Link to time the compressions to avoid the vulnerable T-wave portion of the cardiac cycle.

Applicants respectfully disagree. Gelfand proposes timing compressions that apparently coincide with the portion of the cardiac cycle (the upslope of the T wave) in Link

that resulted in ventricular fibrillation. As such, Gelfand teaches away from avoiding chest wall compressions during this portion of the cardiac cycle. In addition, there is no motivation to combine the teaching of Link, which is concerned with inducing ventricular fibrillation with chest wall impacts in healthy individuals, and the cardiopulmonary resuscitation system of Gelfand.

In particular, Gelfand discusses in column 9, lines 5-10, that the timing of the inflation phase of the vest (corresponding to a compression of the heart) may be at "a predetermined time following the QRS complex wave of the ECG signal." As can be seen in the schematic ECG signal below, the time following the QRS complex coincides with the upslope of the T-wave portion of the cardiac cycle. As noted in the Action, Link discusses that chest wall impacts can induce fibrillation when the impact occurs on the upslope of the T-wave. Therefore, Gelfand teaches away from avoiding CPR compressions on the upslope of the T-wave portion of the cardiac cycle.



In addition, Link is concerned with sudden death resulting from chest wall blows in young, healthy people in sports such as hockey, lacrosse, softball and baseball. Link discusses that the victims of this condition have no known histories of heart disease or other chronic medical illness. Link, page 1, paragraphs 1-2. Link hypothesizes that ventricular fibrillation in healthy individuals may be caused by a chest wall impact during a vulnerable period of the cardiac cycle. Link, page 1, paragraph 2. In contrast, Gelfand proposes a cardiopulmonary resuscitation (CPR) system that is used on patients that are generally already experiencing ventricular fibrillation. Gelfand, col. 1, lines 25-28. Applicants submit that

there is no motivation to combine the teachings of Link, which involve inducing ventricular fibrillation in healthy individuals, with the CPR device of Gelfand, which is used on patients that may already be experiencing ventricular fibrillation.

Therefore, neither Gelfand nor Link teach or suggest 1) identifying a vulnerable portion of an intrinsic spontaneous cardiac cycle of the subject based on the sensed parameter and/or 2) compressing the heart of the subject during a non-vulnerable portion of the intrinsic cardiac cycle based on the identifying step thereby inhibiting reinduction of fibrillation and/or improving cardiac function as recited in independent Claim 26. Independent Claims 41, 42 and 49 include similar recitations, which are reproduced below.

> 41. A system for performing chest compression during cardiopulmonary resuscitation (CPR), comprising;
>
> means for sensing a parameter corresponding to a measure of intrinsic spontaneous cardiac activity of a heart in a subject undergoing CPR;
>
> means for electronically identifying a favorable time to compress the chest to avoid a vulnerable portion of a spontaneous intrinsic cardiac cycle of the subject based on the sensed parameter; and
>
> means for compressing the heart of the subject during a non-vulnerable portion of the intrinsic cardiac cycle based on the identified time.
>
> 42. A system for assisting in chest compression in a subject having cardiomalfunction, comprising:
>
> at least one cardiac activity sensor in communication with the heart of a subject configured to detect a cardiac activity parameter; and
>
> a controller in communication with the at least one cardiac activity sensor, wherein, in operation, the at least one cardiac activity sensor transmits data to the controller regarding a spontaneous intrinsic cardiac cycle of the subject and the controller identifies a favorable time to deliver a chest compression based on the transmitted sensor data to avoid a vulnerable portion of the intrinsic cardiac cycle.
>
> 49. A computer program product for timing the delivery of cardiac compression during CPR, the computer program product comprising:
>
> a computer readable storage medium having computer readable program code embodied in said medium, said computer-readable program code comprising:

computer readable program code that identifies a vulnerable portion of an intrinsic spontaneous cardiac cycle of the subject; and

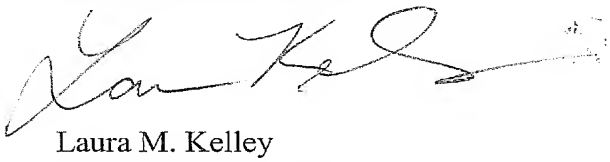
computer readable program code that determines a favorable time to deliver cardiac compression to a subject to avoid a vulnerable period of the spontaneous intrinsic cardiac cycle.

Applicant respectfully submits that Gelfand and/or Link do not teach or suggest at least the emphasized features and requests that the rejections under § 103 of independent Claims 26, 41, 42 and 49 be withdrawn. These features are also not taught or suggested by U.S. Patent No. 6,390,996 to Halperin ("Halperin") (discussed on pages 5-7 of the Action). Claims 27-40, 43-48, 50-59 depend directly or indirectly from independent Claims 26, 41, 42 and 49 and are patentable at least per the patentability of the claims from which they depend.

In addition, certain dependent claims are separately patentable. In particular, Claims 31-33, 44, 45, and 52 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Gelfand in view of Link and in further view of Halperin. Applicant respectfully traverses the rejection and incorporates by reference the arguments made on pages 12-14 in the Amendment and Response to Office Action filed September 13, 2006 in this regard.

Accordingly, Applicant submits that the present application is in condition for allowance and the same is earnestly solicited. The Examiner is encourage to telephone the undersigned at 919-854-1400 for resolution of any outstanding issues.

Respectfully submitted,



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